In the Specification

Please replace paragraph [0017] with the following amended paragraph:

[0017] The model 202 is operable to receive various inputs. It is operable to perceive the externally measurable results of one or more of the systems as the vector **y'''(t)**, the measurable variables **s'''(t)** and the measurable control inputs **x''(t)**. Additionally, the cognitive output **Y(t)** is also input to the model 202. This will yield a predictive result $\mathbf{Y^{(p)}(t)}$ that is a prediction of the state of wellness of the body. As will be described herein below, what is input to the model from the brain are indications of pain, discomfort and general aspect of the wellness condition as perceived by the ~~brain124~~brain 124. Therefore, this model 202 is not a general model of a physiological system but, rather, it is a model of that individual's physiological system parameterized by the interpretation provided by the associated human brain. It may be that the brain 124 has been conditioned, for whatever reason, to over-exaggerate a certain condition, perceive pain where pain does not exist, etc. As such, the physiological system for one person may not result in any perception of lack of well being for the same condition as that of another individual who experiences a great deal of lack of well being. As such, the prediction provided by the model for one individual may not give the same prediction for another individual, i.e., this model is specifically tailored to a particular individual, which can be important in assessing the treatment of an individual.

Please replace paragraph [0023] with the following amended paragraph:

[0023] Referring now to Fig. 8, there is illustrated a more detailed diagrammatic view of the model 202. The model 202 is comprised of a non-linear neural network 802, which neural network 802 is operable to store a representation of the physiological system 402 which is comprised of a mapping or hidden layer containing a stored representation of the system, an input layer and an output layer. The mapping or hidden layer maps the inputs to the outputs through this stored representation such that when an input is provided thereto, a prediction will be provided on the output thereof. These neural networks are trained, as noted herein above, by such techniques as Back Propagation wherein the training set of data comprised of known inputs and known outputs are provided to the model and the "weights" of the model are determined. If enough historical data about the physiological system could be obtained, this model could be

entirely mapped through the stored representation. However, there are a number of physiological systems in the human body that are difficult to measure. For example, it would be very easy to determine the type of food an individual consumes, the type of medications taken by the ~~individual ,~~ individual, but it is difficult, for example, to determine blood serum levels of a drug at any one point in time and over a time period. An individual's wellness or condition can largely be a function of how well a drug is delivered and how well they tolerate that drug, in addition to the type of food they consume and how well the food is digested, etc. For example, an individual may take a blood pressure medicine in the morning and that blood pressure medicine in the form of a time release drug that is operable to distribute the medication to the system over a longer period of time. Alternatively, some drugs are operable to be metabolized very quickly, such as aspirin, which requires the drug to be taken multiple times during the day. In any event, the incident of taking the drug and the time at which the drug actually provides any therapeutic effect is typically not the same, i.e., the result is not instantaneous. Thus, there is a delay that should be accounted for in the model. Of course, an individual could have their blood serum level monitored for various medications over a specified period of time, as well as the physiological reaction to different foods, etc. However, this is not practical in most situations.

Please replace paragraph [0026] with the following amended paragraph:

[0026] Referring now to Fig. 9, there is illustrated a simplified diagram of a general first principles model 902. The first principles model 902 is operable to receive inputs on an input 904 and provide outputs on an output 906. The first principles engine that is a part of the model is an algorithm. This algorithm is typically parameterized for its particular function by parameters and data stored in a table 908. For example, the same model could be utilized for any drug. However, the intake and metabolism a particular drug is a function of its intake, its uptake and excretion, all of which are fairly well known aspects of the drug. The table 908 would therefore parameterize the model for a particular drug. Additionally, a more complex aspect thereof is the interaction of multiple drugs. In any event, the table 908 is utilized by the first ~~principles's~~ principles' engine to provide an overall model of the metabolism of certain drugs, fats, carbohydrates, etc. over time from a point in time that such drugs, fats, carbohydrates, etc., were ingested. This single instance of ingestion will be extrapolated to a time series of data

inputs for input to the neural network for either training or operation in the form of prediction thereof.